Note on a Possible Eclipse of Jupiter's Second Satellite by the Shadow of the Third 1896 *March* 30. By A. C. D. Crommelin.

The April number of the "Journal of the Astronomical Society of Wales" contains the following communication from Mr. Fred Jackson, of Stoke-on-Trent: "A curious extinction of Satellite II. took place for a few seconds March 30, about 9^h 10^m. The other satellites appeared as usual, but II. was very indistinct before its strange disappearance, and of a dirty yellow colour." This description suggested an eclipse by the shadow of one of the other satellites, and on examination I found that the shadow of III. was in close proximity to II. at the time named. In reply to my request for further particulars, Mr. Jackson forwarded the following additional details, which he permits me to reproduce :—

"On March 30, about 9^h 20^m (the time 9^h 10^m given in the 'Journal of the Astronomical Society of Wales' is erroneous), observing with a 5-inch reflector, power 110, I noticed that Satellite II. was very faint and indistinct. It was very much smaller than the others, and required quite an effort to see it. I happened to turn from the telescope for a minute or so, and when I looked again I could not see the satellite for a few seconds, the other satellites being visible at the first glance. When I caught sight of II. again it was small and ill-defined, and appeared as though it was struggling through something. It grew brighter shortly afterwards, but not as bright as I have seen it on other occasions, even in the immediate vicinity of the primary. I left off observing Jupiter shortly afterwards, and did not see the occultation of II., which took place at 9^h 57^m. The night was not a very favourable one for observation, only first and second magnitude stars being visible to the naked eye. The details on the surface of Jupiter were not sufficiently well-defined to permit of making a drawing."

Mr. Jackson states that he has been observing for some years, and has had a fair amount of experience.

Mr. Marth kindly communicated to me the following particulars of the heliocentric positions of the satellites :—

True time.	Time corrected for light passage to Earth 41 mins.	Relative heliocentric positions of II. and III. x_2-x_3.	y_2-y_3.
d h m	h m	"	"
Mar. 30 8 20	9 1	− 9·89	+ 3·60
8 50	9 31	+ 1·20	+ 3·55
9 20	10 1	+ 12·36	+ 3 50

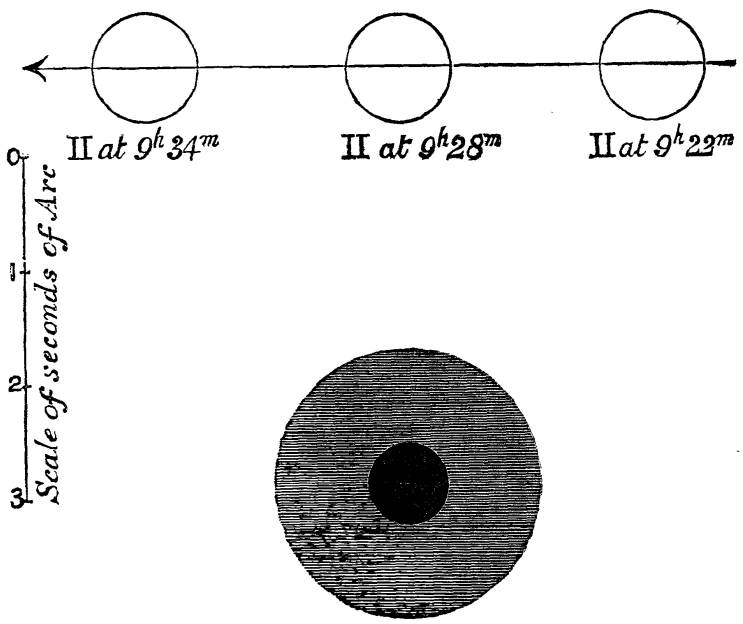

Diagram illustrating the Conjunction of Satellite II with the Shadow of III.

The diagram shows the projection of the shadow of III. on a plane through II., normal to the radius vector, and the position of II. relatively to the shadow at $9^h\ 22^m$, $9^h\ 28^m$, and $9^h\ 34^m$. (These times have been corrected for the time of light passage to the Earth.) The assumed diameters of the satellites are III. 3,560 miles, and II. 2,200 miles. It will be seen that an error of 2″ in the difference of the latitudes of the satellites, as given by the Tables, would suffice to bring II. partially within the penumbra of III. Such an error is larger than we should expect, but perhaps not wholly inadmissible. I am, however, by no means confident that an eclipse actually occurred; though, if not, the almost perfect agreement in time between this observation and conjunction with the shadow would be a curious coincidence. But the possibility of such a rare phenomenon having taken place makes it advisable to call attention to the above observation. According to Webb's "Celestial Objects for Common Telescopes" (4th edition, p. 164), there is one case on record of the eclipse of one satellite by the shadow of another; the reference, however, is not given, and I have not been able to identify it. It is scarcely necessary to point out the great value of undoubted observations of the kind for determining the positions of the orbital planes of the satellites.

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Measures of the Polar Diameter and of the Principal Belts, and of Two Dark Spots on Jupiter, and of the Satellites and their Shadows in Transit, made at Mr. Crossley's Observatory, Bermerside, Halifax, during the Apparition of 1895–96. By Joseph Gledhill.

Measures of the Polar Diameter.

The following results were obtained in four ways—A, by direct measures of the polar diameter of the apparent disc; B, by measures of the distances of satellites and shadows in transit from the poles of the disc; C, by measures of the distances of dark spots in transit from the two poles; D, by measures of the distances of the principal dark bands from the two poles.

In every case the micrometer was set to the computed position angle of *Jupiter's* equator as given by Mr. Marth.

The instrument used was the $9\frac{1}{3}$-inch Cooke equatorial refractor, with the parallel-wire micrometer by Simms, power 282.

A.

Under *a* is given the number of measures; under *b* the diameter; *m* measured, M Mr. Marth's value (both to the nearest tenth of a second); and under *c* the difference between *m* and M.

	a	*b* *m*	*b* M	*c*		*a*	*b* *m*	*b* M	*c*
1896.		″	″	″			″	″	″
Feb. 26	12	42·3	42·0	+0·3	Apr. 21	7	35·9	35·8	+0·1
Apr. 11	6	36·6	36·9	−0·3		6	36·1	35·8	+0·3
12	5	36·8	36·8	0·0	22	5	35·8	35·7	+0·1
13	8	36·4	36·7	−0·3	23	10	35·6	35·6	0·0
15	9	36·3	36·5	−0·2	24	5	35·6	35·5	+0·1
16	6	36·1	36·3	−0·2	26	6	34·9	35·3	−0·4
18	7	36·1	36·1	0·0	28	7	35·1	35·0	+0·1
20	5	36·0	35·9	+0·1	29	5	34·7	34·9	−0·2

The mean difference, regardless of sign, is nearly 0·″2.

B.

Feb. 23	39	43·0	42·2	+0·8	Apr. 3	2	38·1	37·8	+0·3
Mar. 18	9	40·0	39·7	+0·3	6	20	37·7	37·5	+0·2
19	2	39·5	39·6	−0·1	20	4	36·6	35·9	+0·7

The mean difference is 0·″4.